

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A high performance SiGe HBT ~~that has~~ comprising a SiGe layer with a peak Ge concentration ~~of at least approximately 20%~~ and a boron-doped base region ~~formed therein~~ having a thickness, wherein said base region includes diffusion-limiting impurities throughout said thickness at a concentration below that of boron in said base region, wherein said SiGe layer has a thickness that is substantially greater than a peak concentration thickness of the Ge and wherein said diffusion limiting impurities are physically located relative to both said base region and a portion of said SiGe layer ~~having a~~ and wherein said peak Ge concentration of is at least approximately 20% to optimize performance and yield of said SiGe HBT.

2. (Cancelled)

3. (Withdrawn)

4. (Cancelled)

5. (Currently Amended) ~~The device of claim 1;~~ A high performance SiGe HBT comprising a SiGe layer with a peak Ge concentration and a boron-doped base region having a thickness, wherein said base region includes diffusion limiting impurities throughout said

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thickness at a concentration below that of boron in said base region, wherein said diffusion limiting impurities are physically located relative to both said base region and a portion of said SiGe layer, and wherein said peak Ge concentration is at least approximately 20% to optimize performance and yield of said SiGe HBT and wherein said SiGe layer has a thickness of approximately 300-900 Å, and wherein the Ge has a peak concentration thickness of approximately 20-100 Å.

6. (Currently Amended) The device of claim 5, wherein said base region is approximately 10-150 angstroms Å in thickness.

7. (Original) The device of claim 6, wherein the base region has a peak boron concentration of boron of approximately $8.5 \times 10^{19} / \text{cm}^3$.

8. (Original) The device of claim 1, wherein said diffusion limiting impurity comprises carbon.

9. (Original) The device of claim 8, wherein said carbon has a peak concentration between approximately $1 \times 10^{19} / \text{cm}^3$ and $4 \times 10^{19} / \text{cm}^3$.

10. (Currently Amended) The device of claim 8, wherein said carbon defines a dopant region that is approximately 10 - 500 ~~angstroms~~ \AA in thickness.

11. (Currently Amended) ~~The device of claim 8;~~ A high performance SiGe HBT comprising a SiGe layer with a peak Ge concentration and a boron-doped base region having a thickness, wherein said base region includes diffusion limiting impurities throughout said thickness at a concentration below that of boron in said base region, wherein said diffusion limiting impurities are physically located relative to both said base region and a portion of said SiGe layer, and wherein said peak Ge concentration is at least approximately 20% to optimize performance and yield of said SiGe HBT and wherein said carbon has diffusion limiting impurity defines a dopant region having an upper bound and a lower bound, wherein said peak concentration thickness of said Ge has an upper bound and a lower bound, and wherein said lower bound of said carbon diffusion limiting impurity region is within approximately 150 angstroms \AA of said upper bound of said peak concentration thickness of said Ge.

12. (Currently Amended) The device of claim ~~10~~ 11, wherein said base region is within approximately 200 - 250 ~~angstroms~~ \AA of said upper bound of said peak concentration thickness of said Ge.

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13. (Withdrawn)

14. (Withdrawn)

15. (Withdrawn)

16. (Withdrawn)

17. (Cancelled)

18. (Currently Amended) ~~The device of claim 16;~~ A SiGe HBT comprising an a SiGe layer, a base region, and a diffusion-limiting region, in which said diffusion-limiting region extends substantially throughout said base region and has a dopant concentration less than that of said base region, and wherein both said base region and said diffusion-limiting region are spaced within a given distance of a portion of said SiGe layer having a peak Ge concentration of at least approximately 20% so as to optimize both performance and yield of said SiGe HBT, and wherein said base region is within approximately 250 Å of said portion of said SiGe layer having a peak Ge concentration.

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19. (Currently Amended) The device of claim ~~17~~ 18, wherein said diffusion-limiting region is within approximately 150 Å of said portion of said SiGe layer having a peak Ge concentration.

20. (Cancelled)

21. (New) The device of claim 11, wherein said diffusion limiting impurity comprises carbon.